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FOREWORD

The long awaited SA-8, the latest addition to the already impressive range of Soviet SAM systems, at last appeared in public on the Moscow Parade on 7 November 1975. The first article in this issue describes SA-8 and, as can be seen this weapon is quite a feat of systems engineering.

Armed helicopters are appearing in the Soviet forces in ever increasing numbers. Of particular interest is the heavily armed HIND-A with its ATGW, air-to-ground rockets and machine guns.

As with all military equipment, of whatever country of origin, Soviet equipment has its weaknesses as well as its strengths. An article on BMP attempts to give a balanced view of this modern Soviet MICV.

An interesting innovation by the Soviets is an aerodynamic parachute trainer which apart from its very practical use in training parachutists could be a fun-machine for those with ingenuity!

The chemical warfare theme is continued from the last issue with a description of the Soviet DDA Mobile Decontamination Equipment and its operation in the field.

Other articles deal with the Czech TATRA-813 Trackway vehicle, the emergence of laser rangefinders in China, the Soviet R-107 radio, a new Hungarian anti-personnel mine and a centrifugal oil filter, widely used in Soviet vehicles, which once more illustrates that the Soviets will use advanced designs when they consider it worth while.

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1. SA-8 New Soviet Mobile SAM System

A new mobile surface-to-air missile system, designated SA-8, was paraded by the Soviets on the Moscow parade of November 1975.

Fig 1. SA-8 SAM System

The system is mounted on a wheeled chassis following Soviet practice of using wheels in preference to tracks for the tactical missile systems of their Ground Forces. These wheeled systems have good road mobility and there is little loss of off-road mobility due to the central tyre inflation system which allows tyre pressures to be varied on the move to suit the terrain. The vehicle appears to be amphibious and this would further increase the system's battlefield mobility.

SA-8 is a self-contained system mounting four missiles, a surveillance radar which folds down for travelling, and a fire control system that includes two missile tracking dishes, one under each pair of missiles. In common with other SAM systems, SA-8 can only engage one target at a time, but two missiles can be independently controlled against that target. This novel facility considerably increases the lethality of the system, as does the electro-optical target tracker which is an effective counter to ECM jamming in addition to providing improved performance against low-flying aircraft.

SA-8 appears to be a massive system with overall dimensions of 9 m long and 5 m high, and a silhouette of Roland, (with which,SA-8 has been compared) is superimposed on a SA-8 for comparison. Roland 2 and SA-8 are both designed as all-weather counters to low-level aircraft although the larger missile of SA-8 is expected to give it about double the range of Roland's claimed 6 km.

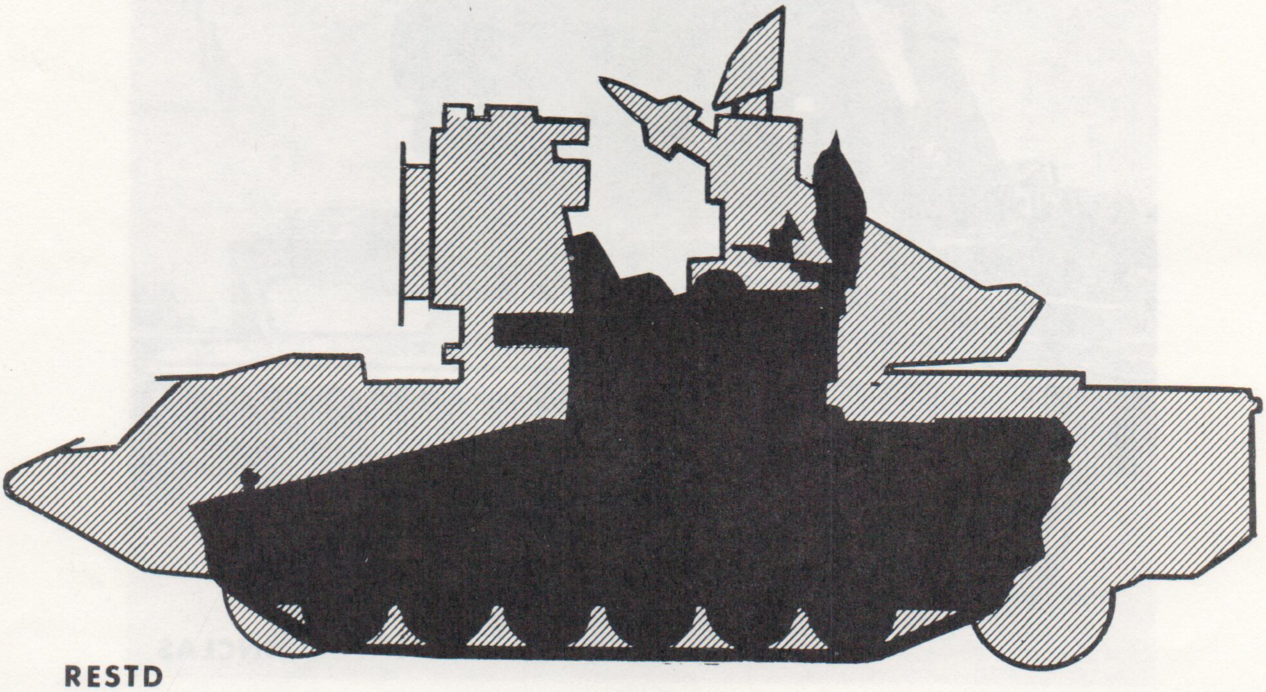

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Fig 2. Size Comparison between SA-8 and Roland

SA-8 is likely to be deployed with Soviet divisions, both for area and point air-defence but there is, as yet, no confirmation of this.

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2. Soviet Combat Assault Helicopter - HIND (Mi-24)

Introduction

The Combat Assault Helicopter HIND-A is the first helicopter specifically designed by the Soviets to carry armament. Previous to the appearance of HIND the Soviets had always modified utility helicopters by the addition of strap-on armament. HINDs were first seen by the West in 1971 and deployed operationally in East Germany and throughout the Soviet Union in 1973.

Fig 1. Combat Helicopter HIND-A (Mi-24)

Design

The HIND represents a radical departure from typical Soviet design practice. It exhibits several significant design features to improve forward flight performance, including internal fuel stowage, retractable tricycle landing gear and improved surface finish.

When comparing the HIND with Western armed helicopters, especially with the US Huey Cobra and prototype Armed Attack Helicopters, it should be remembered that the development work on HIND probably started in the mid-1960s. The design was undoubtedly greatly influenced by the US experience in Vietnam where at that time the Iriquois carrying strap-on armament was proving the effectiveness of armed helicopters in a fire support role.

Two variants of the HIND have been identified: HIND-A has anhedral wings with end plates while the HIND-B has straight wings without end plates. It is probable that the HIND-B is a prototype aircraft as it has not been seen in service.

Estimated Characteristics

a.	Crew:	Two pilots and a gunner
b.	Troop Capacity:	8
c.	Fuselage Length:	17.2 metres
d.	Wing Span:	6.64 metres
e.	Main Rotor Diameter:	17.0 metres

Estimated Performance

a.	Maximum All Up Weight:	8400 kg
b.	Fuel:	1500 kg
c.	Maximum Range:	600 km
d.	Maximum Radius:	325 km
e.	Cruising Speed:	315 km/h
f.	Maximum Speed:	333 km/h

Armament

The HIND carries a comprehensive range of armaments. The normal fit includes a heavy machine gun in the nose, up to 128 x 57 mm air-to-surface rockets in four pods and four ATGW missiles on the wing end plates. Other Soviet helicopters have been seen carrying 250 kg bombs in place of rocket pods and it is therefore possible that HINDs may also on occasions carry bombs.

The machine gun carried in the nose of HIND is probably the same 12.7 mm aircraft machine gun that is mounted on the HOUND and HOOK helicopters. If so it has a limited effective range and would probably only be used to provide suppressive fire in the final phase of an air assault operation.

The S-5 57 mm air-to-surface rocket carried on HIND was originally designed as an air-to-air weapon but is now used principally in an air-to-ground role. The rocket is unguided. Both HE and HEAT warheads exist for the S-5 rocket and a mix of warhead types is probably carried in each pod.

The ATGW mounted on HIND is almost certainly SWATTER and it may be a semi automatic version.

Employment

The HIND was probably designed as a combat assault helicopter with the dual tasks of fire support and armed transport. The primary Soviet transport helicopter is however the HIP (Mi-8) and it is unlikely that HIND would be used as a transport during a major air assault operation. Nevertheless HIND could be used to transport troops for special operations. Other tasks are likely to include:

a. Fighter ground attack

b. Anti-tank

c. Reconnaissance

d. Flank protection

Conclusions

The recent development of HIND indicates the beginning of a new trend in Soviet helicopter design. This system apparently affords maximum combat versatility and flexibility in a single design. Further modifications may include adaption of weapon systems currently under development and rotor improvements to increase flight speeds.

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3. Trackway Mounted on TATRA-813

In ATIR No 106, there was an article on Czechoslovakian "B" vehicles. One of the more modern of these was the TATRA-813 which has a very good cross-country performance and an excellent reputation with Warsaw Pact army drivers.

The 8 x 8 version of TATRA-813 is employed in many roles including a use as the transport for the Czechoslovak PMS Heavy Pontoon Bridge. In addition each bridge company may have a special vehicle which carries a folding metal trackway (fig 1.) to provide a good bridge approach when the going is poor. Later versions of these vehicles are also provided with a bulldozer blade to improve the gradient where necessary.

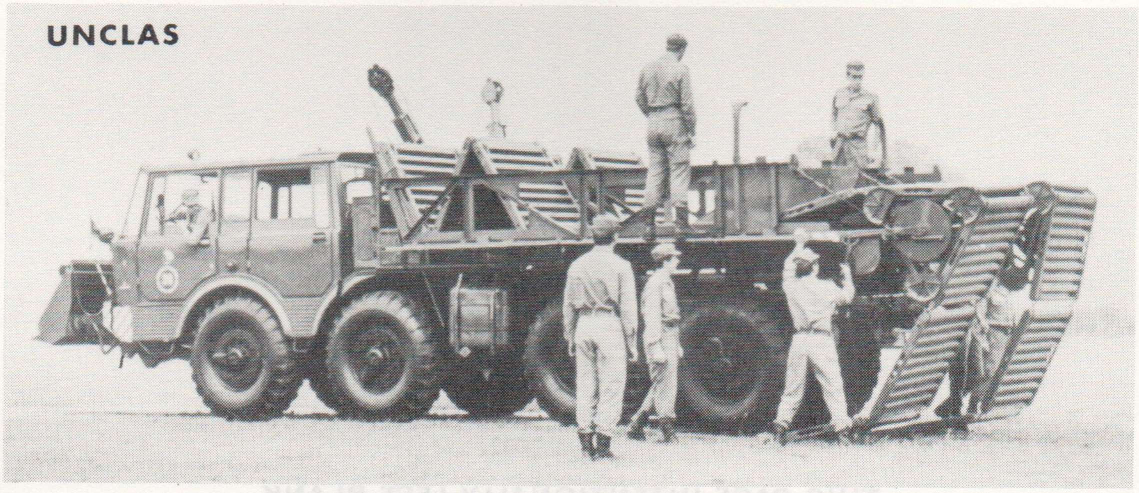
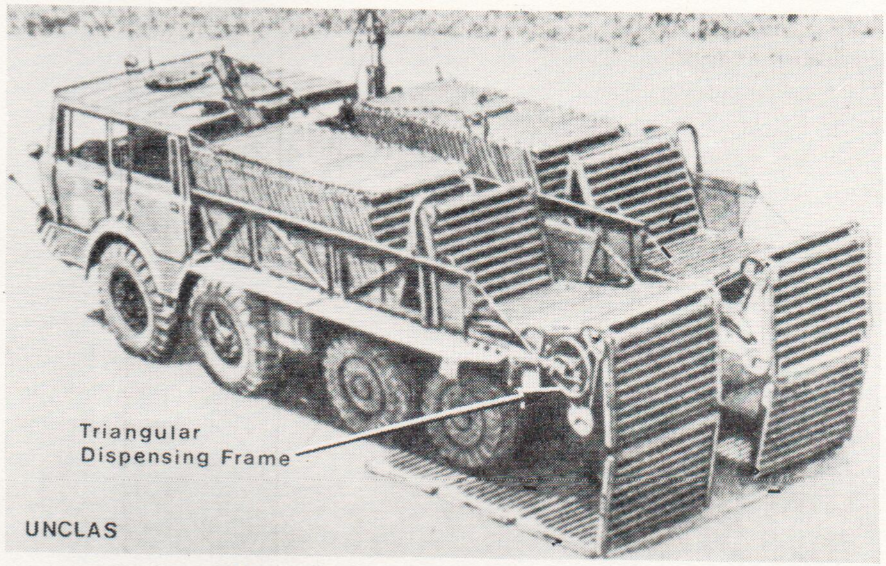


Fig 1. Trackway Mounted on TATRA-813

The trackway consists of folding sections and each section is constructed of hollow metal tubes mounted transversely in a grill-like panel, about 1.2 metres long and 1.2 metres wide. There are forty sections on each side of the vehicle and these give a total effective length of about 48 metres of trackway with an overall width of just over 3 metres.

The trackway is unfolded and laid by means of triangular dispensing frames at the rear of the vehicle. The frames swing down to lay the track and are provided with single rimmed guide wheels at their three corners (see fig 2.). The initial sections are pulled out by hand and placed under the rear wheels of the vehicle. The vehicle then reverses slowly and the remaining sections of the track are pulled out automatically from the rear of the vehicle.

Fig 2. Initial Stage in Laying Trackway



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4. Hungarian Anti-Personnel Mine GYATA-64

An anti-personnel mine that has recently been identified is the Hungarian Gyata-64. It is a blast type pressure-operated mine developed from, and an improvement on, the Russian PMN anti-personnel mine which is described in Army Technical Intelligence Review Digest "Soviet Bloc and Chinese Communist Engineer Equipment".

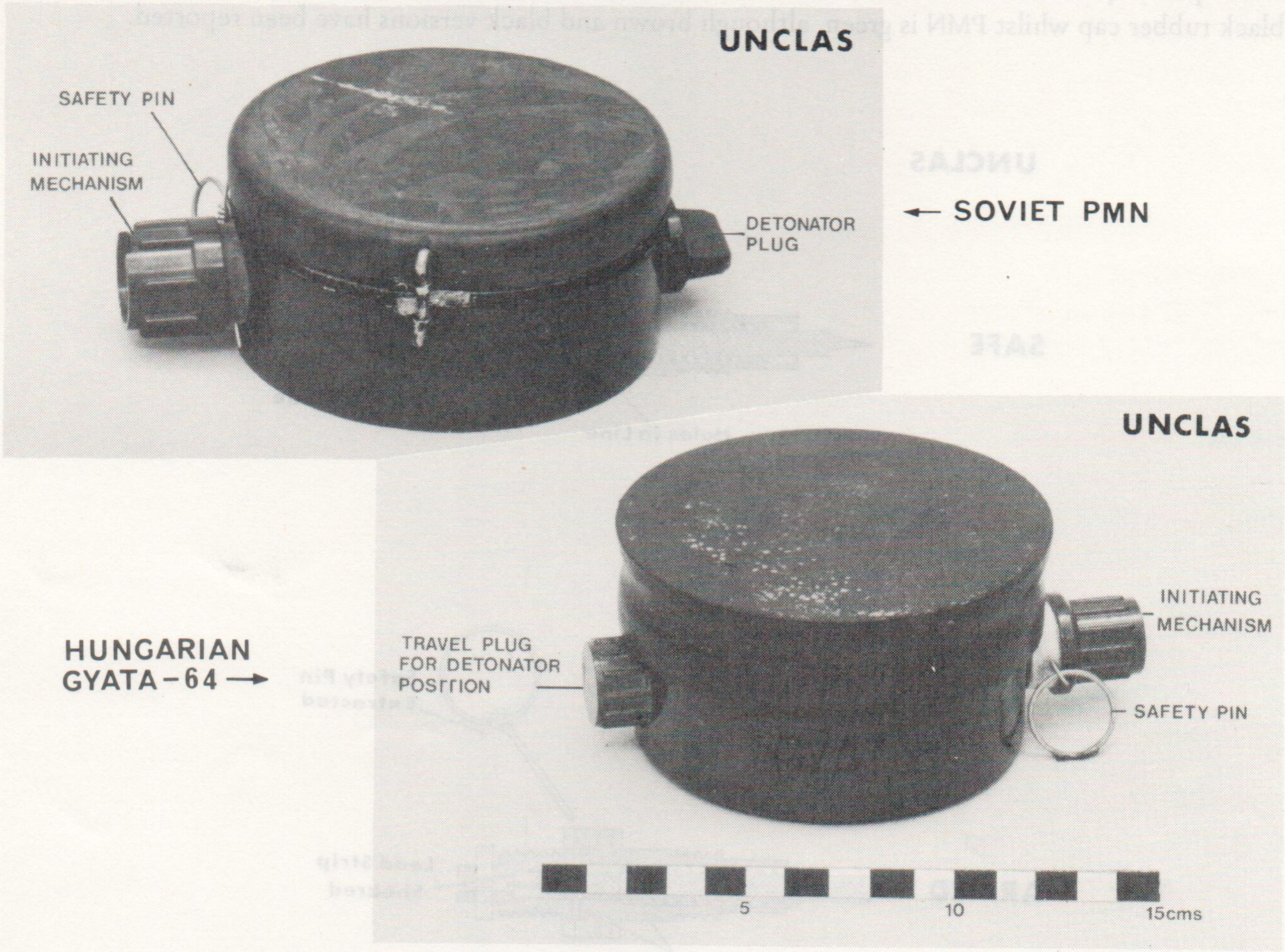

Fig 1. Comparison of GYATA-64 and PMN

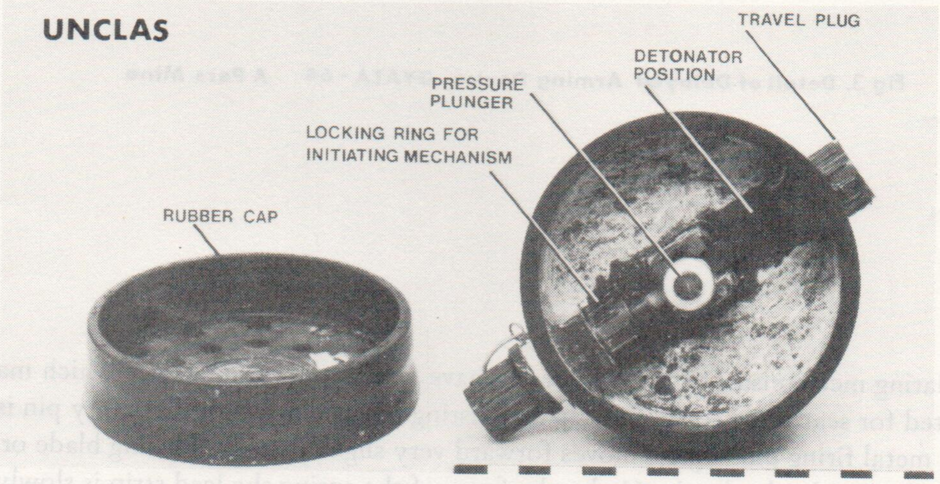

Fig 2. Interior of GYATA-64 A Pers Mine

Both types of mine have a hard plastic cylindrical case with the detonator positioned on one side and the initiating mechanism opposite to it. A rubber cap is fitted over the top of the case to prevent moisture entering and PMN is provided with a metal retaining clamp to keep the rubber cap in position.

The most obvious difference between the mines is that Gyata-64 has a plain base but PMN has four equally spaced radial ribs underneath for added strength. Gyata-64 has a dark brown case with a black rubber cap whilst PMN is green, although brown and black versions have been reported.

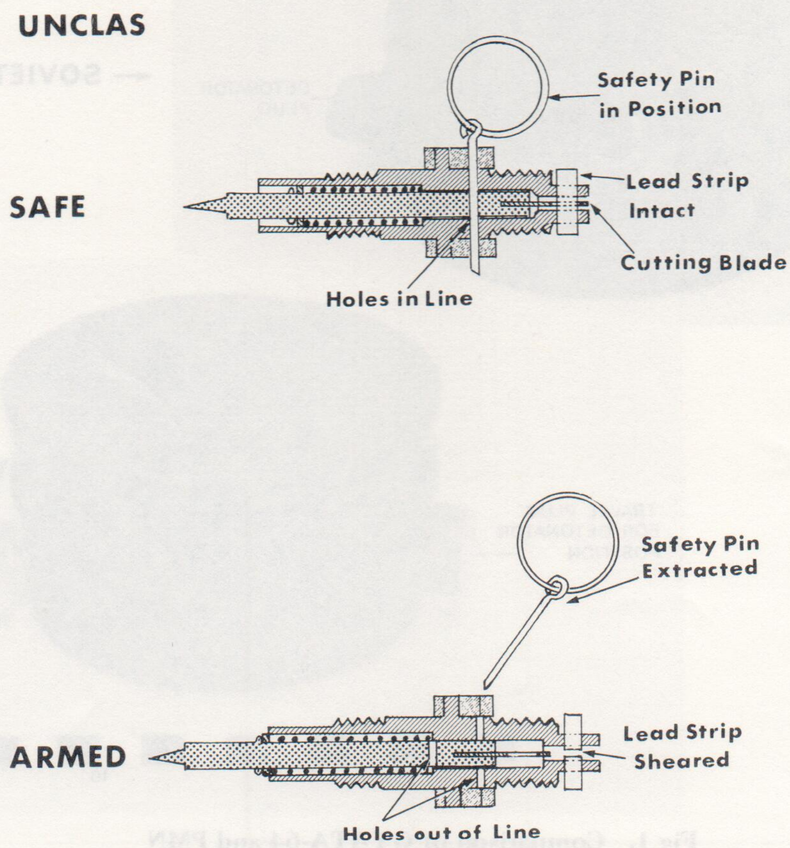

Fig 3. **Detail of Delayed Arming Device GYATA-64 A Pers Mine**

The initiating mechanisms of these mines all have a delayed arming device which makes them especially suited for scattering to thicken up an existing minefield. When the safety pin is withdrawn, a spring-loaded metal firing pin (fig 3.) moves forward very slightly until a cutting blade or wire at its end comes into contact with a lead strip. Under the force of the spring the lead strip is slowly sheared, until after 15–20 minutes the firing pin is free to move forward until it rests against a retaining keyway in

the pressure plunger (fig 4.). The mine is then fully armed. When the firing pin has moved forward the safety pin can no longer be re-inserted to make the mine safe. Once the mine is armed, pressure on the top of the mine will depress the plunger and release the firing pin so that it strikes the detonator and sets off the mine.

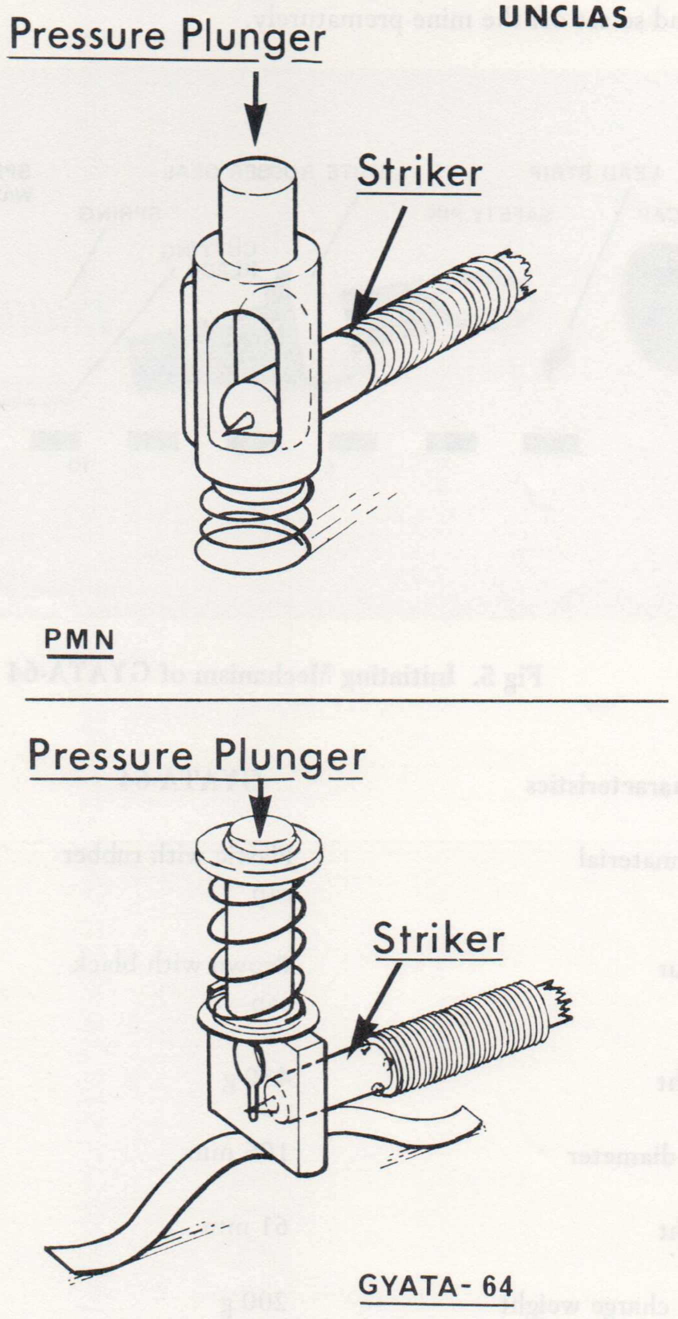

Fig 4. Firing Pins in Fully Armed Position

The design of the firing action of these mines, especially PMN, makes them a hazard if handled when armed. Disarming should not be attempted if it can be avoided but if action must be taken, the detonator plug should be unscrewed gently – it has a right hand thread – and the detonator removed by tilting the mine without jolting or shaking it in any way. With Gyata-64, the plug and detonator are in one piece, but with PMN they are separate. The Hungarian mine has an internal locking ring which prevents removal of the firing mechanism, and although the mechanism of the Soviet mine can be unscrewed there is a grave risk that in doing so the firing pin will ride over the retaining keyway in the pressure plunger and so set off the mine prematurely.

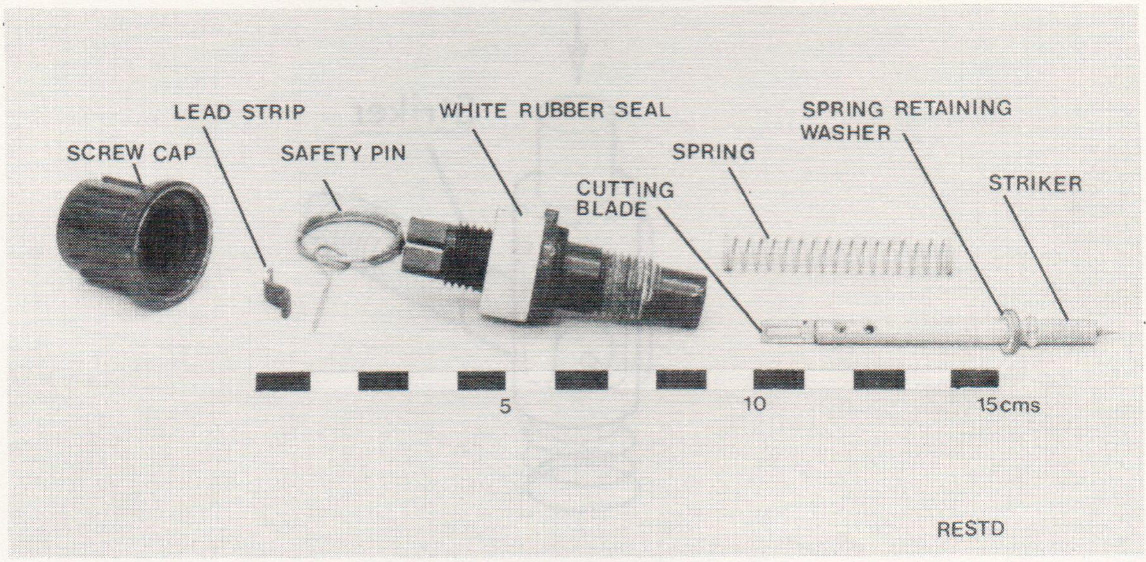

Fig 5. Initiating Mechanism of GYATA-64

Main Characteristics	GYATA-64	PMN
Case material	Plastic with rubber cap	Plastic with rubber cap
Colour	Brown with black cap	Green
Weight	450 g	600 g
Case diameter	106 mm	112 m
Height	61 mm	56 mm
Main charge weight	200 g	240 g

5. New Soviet Aerodynamic Parachute Trainer

The Soviet Union continues to consider its Airborne Forces as elite troops and considerable effort and ingenuity is devoted to their training. The latest in a long line of parachute training devices is an Aerodynamic Parachute Trainer, which is basically a wind generating system, shown in fig 1.

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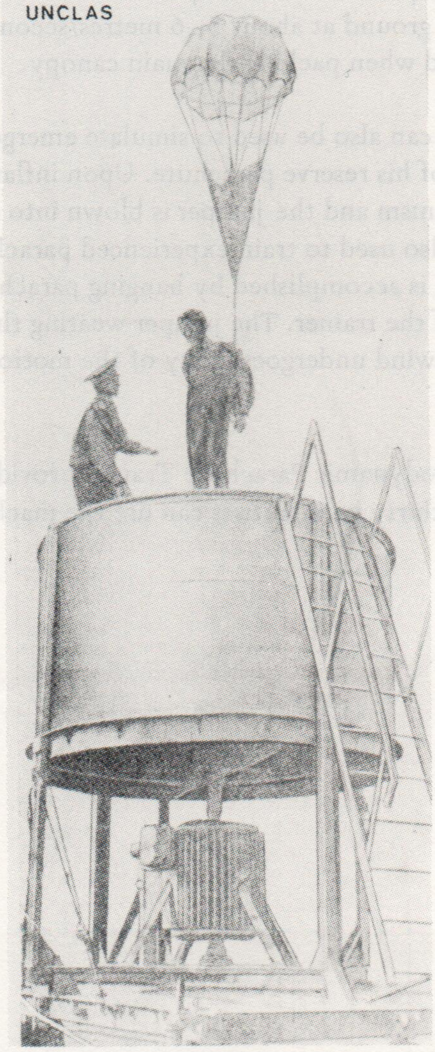


Fig 1. Aerodynamic Parachute Trainer

The main elements of the system are a propeller driven by a 90 kW electric motor, a sheet iron cylinder 3 metres in diameter and a wheeled platform, usually a modified heavy-drop platform.

To operate the system a technician starts the electric motor and adjusts its revolutions to a pre-determined nominal speed. The trainee, wearing a parachute, stands on a metal screen covering the trainer's opening, exposes his back pack parachute to the upward thrust of the generated wind and prepares for the simulated jump. The operator attaches a quick release fastener to a retaining strap that is connected to the parachute harness and begins to increase the motor revolution to the desired speed. At this point the training instructor opens the parachute pack to release the stabilising parachute thus exposing it to the windstream. As soon as the stabilising canopy is inflated the trainee begins the

stabilisation countdown, usually four to five seconds, and then pulls a ripcord to deploy the main canopy. When the main canopy has been extracted by the stabilising parachute and inflated the operator in charge of the wind generating system, on a signal from the instructor, releases the locking mechanism holding the retaining strap and the trainee parachutist is thrust into the air to an altitude of 70 metres. He then descends to the ground at about 5–6 metres/second. To ensure quick and reliable opening the canopy cover is omitted when packing the main canopy.

This parachute training device can also be used to simulate emergency situations where the parachutist has to pull the ripcord of his reserve parachute. Upon inflation of the reserve canopy the operator releases the locking mechanism and the jumper is blown into the air in the same manner as for normal training. The trainer is also used to train experienced parachutists in free-fall or high altitude, low opening, jump techniques. This is accomplished by hanging parachute suspension lines with a modified harness over the mouth of the trainer. The jumper wearing the harness and being exposed to the upward thrust of the generated wind undergoes many of the motions experienced by a parachutist during actual free-fall drops.

The Soviets claim that the Aerodynamic Parachute Trainer provides a most realistic simulation of parachute jumps and an average of thirty parachutists can use the machine in an hour.

6. Soviet Mobile Decontamination Equipment

The Soviet Army has developed a range of equipments designed to provide showers for personnel and to remove chemical or biological agent contamination. The equipment may also be used to delouse normal uniform clothing. This article illustrates the range of vehicles and explains their common operating principle.

Fig 1. DDA-53 on GAZ-63

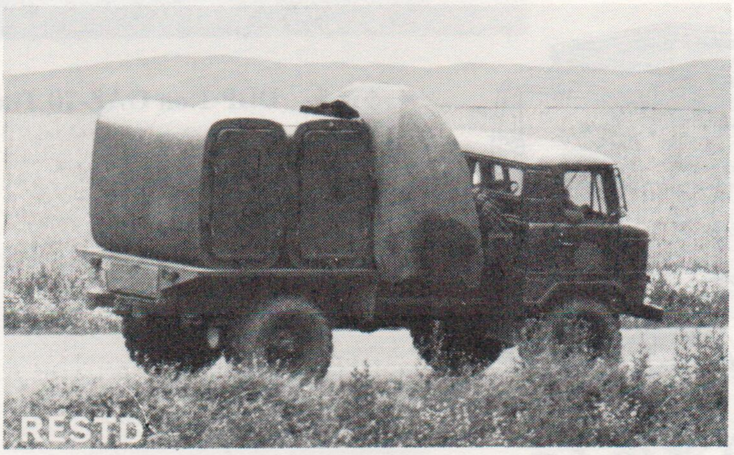


Fig 2. DDA-53 on GAZ-66

The oldest equipment seen regularly in service is the DDA-53 (fig 1.). Originally mounted on GAZ-51 or GAZ-63 trucks, the latest models are seen on GAZ-66 (fig 2.). The DDA-2 is technically the most advanced equipment, according to Soviet claims, and is readily recognised as it is mounted on the 4 x 2 ZIL-130 chassis (fig 3). The DDA-66 (fig 4) is mounted on the GAZ-66 chassis but is easily distinguished by its shape. Intended mainly for medical sub-units, it is normally seen with Red Cross markings. Two trailers may also be used in the same role, the older DDP-1 (fig 5) mounted on the 1.5 tonne GAZ-70 trailer and its replacement, the improved DDP-2 (fig 6).

Fig 3. DDA-2 on ZIL-130

Fig 4. DDA-66 on GAZ-66

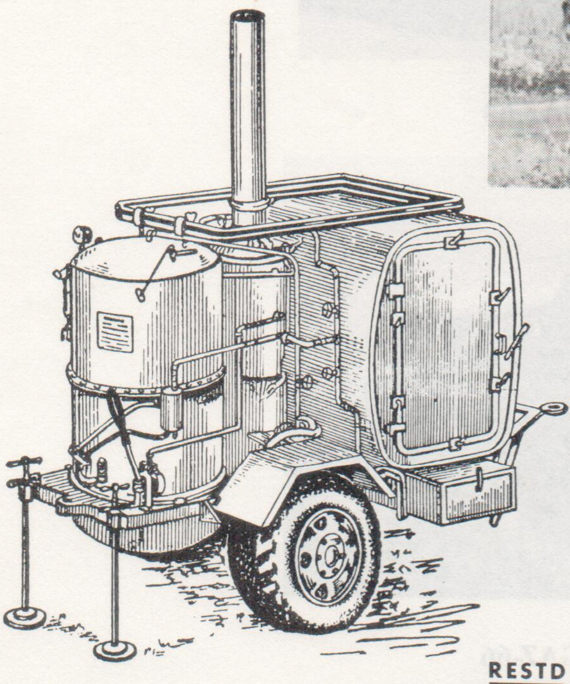
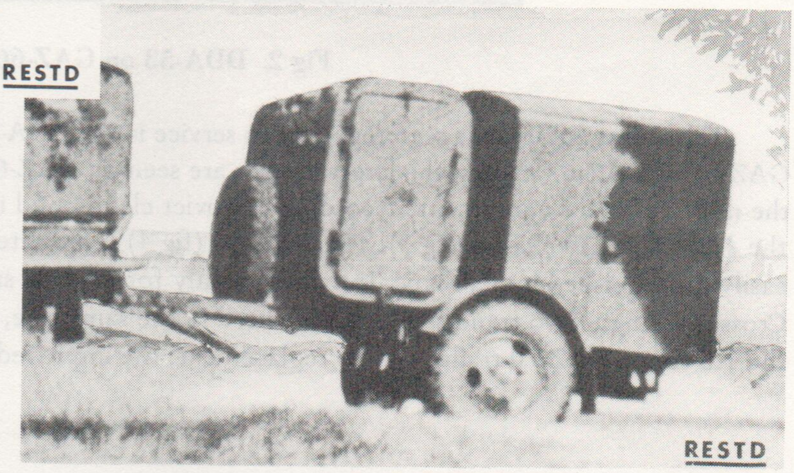


Fig 5. DDP-1 on GAZ-70 Trailer

Fig 6. Improved DDA-2 Trailer



The operation of all these equipments is similar and is evident from the DDA-53 layout shown in fig 7. The DDA-53 has a boiler, two autoclaves or disinfection chambers, a boiler-accumulator, a hand pump, a steam-jet suction pump, water and steam pipes, two six-man shower sets, packing cases and a reserve fuel tank.

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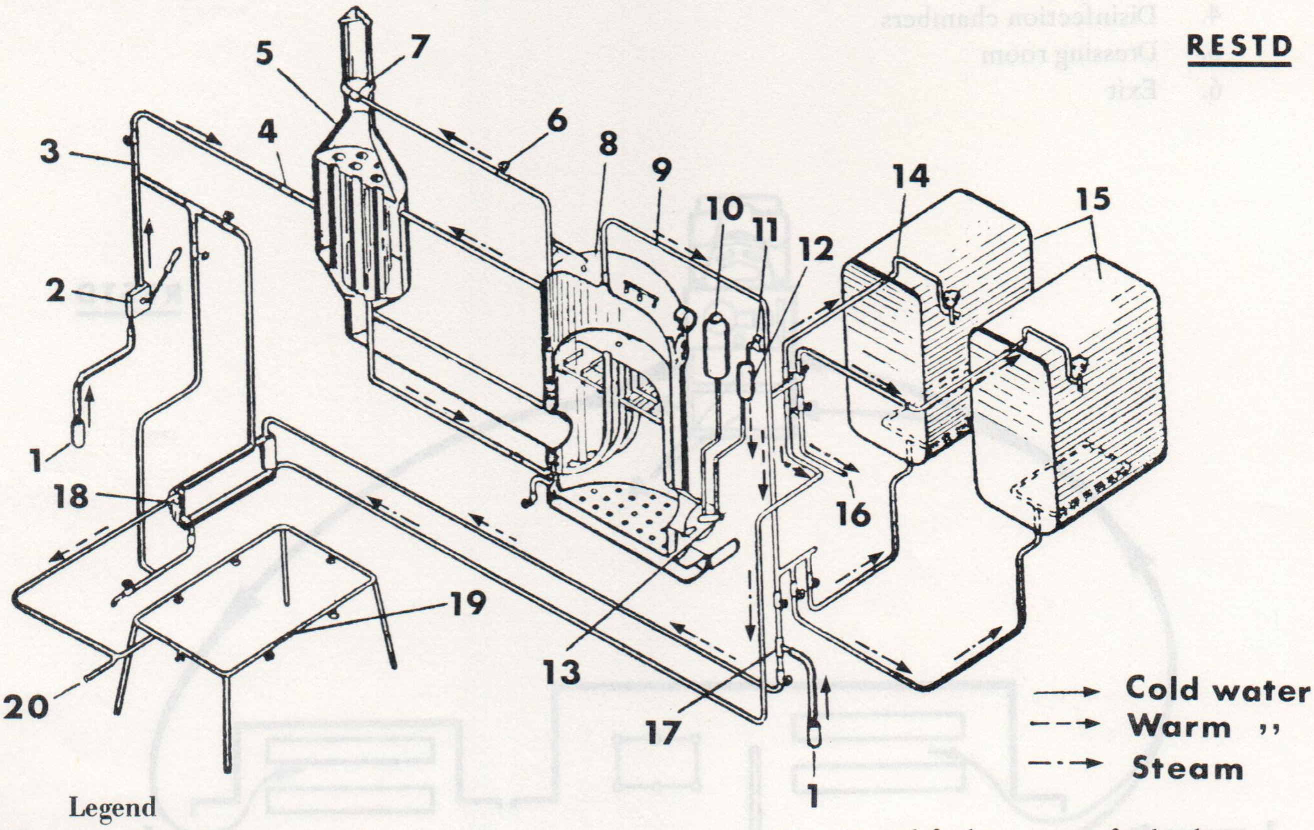

Legend

1. From reservoir
2. Pump
3. Delivery pipe
4. Feed valve
5. Water pre-heater
6. Siphon steam feed-valve
7. Siphon
8. Boiler
9. Main steam pipe
10. Liquid fuel tank
11. Liquid fuel jet steam feed-valve
12. Condensation tank
13. Liquid fuel jet
14. Steam pipe to formalin jet
15. Disinfection chambers
16. To atmosphere
17. Steam jet suction pump
18. Boiler accumulator
19. Shower set
20. To second shower set

Fig 7. DDA-53 Operating Layout

The boiler may burn diesel oil, or solid fuel if another firegrate is fitted. Diesel fuel consumption is claimed to lie in the range 21–29 kg/h, depending on temperature. Warming-up time is 30–45 minutes in summer and 1–1½ hours in winter.

Each autoclave or disinfection chamber is a welded steel shell lined with steel plate internally and plywood and steel plate externally. On the floor is a rectangular steam pipe with outlets. Formalin may be sprayed in the chamber via a jet connected to an external tank. Formalin is used for delousing or

disinfection. Chemical agent contamination is destroyed by steam treatment.

Legend
1. Entrance
2. Undressing room
3. Shower room
4. Disinfection chambers
5. Dressing room
6. Exit

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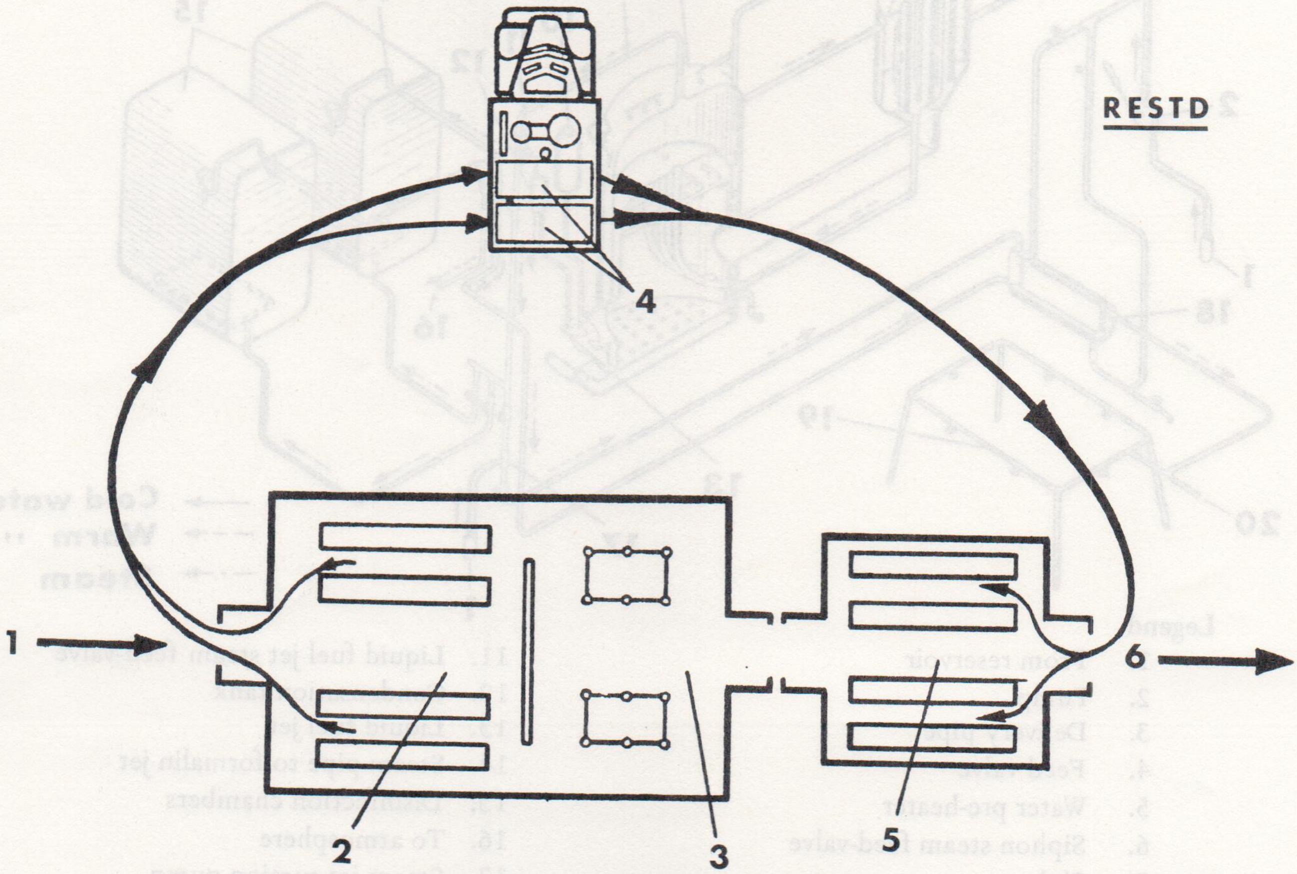

Fig 8. DDA Site

In operation a DDA unit is laid out as shown in fig 8. Troops enter at (1), undress at (2) and shower at (3). Dirty or contaminated clothing is taken to (4) for treatment whilst previously cleaned and dried clothing is taken to (5) for the soldiers to dress. This type of decontamination station may be used in conjunction with a vehicle decontamination station. For example, a combat unit might receive decontamination treatment from a combined TMS-65 sub unit and a DDA station.

DDA vehicles and DDP trailers are held in chemical defence units at Division, Army and Front level. They fulfil the dual role of decontamination and hygiene in the field.

7. Chinese Laser Rangefinders

During the past nine months photographs of two different laser rangefinders have appeared in Chinese publications. Although it is not clear whether they are of entirely indigenous design and manufacture, it is obvious that the Chinese place a high priority on laser research and development.

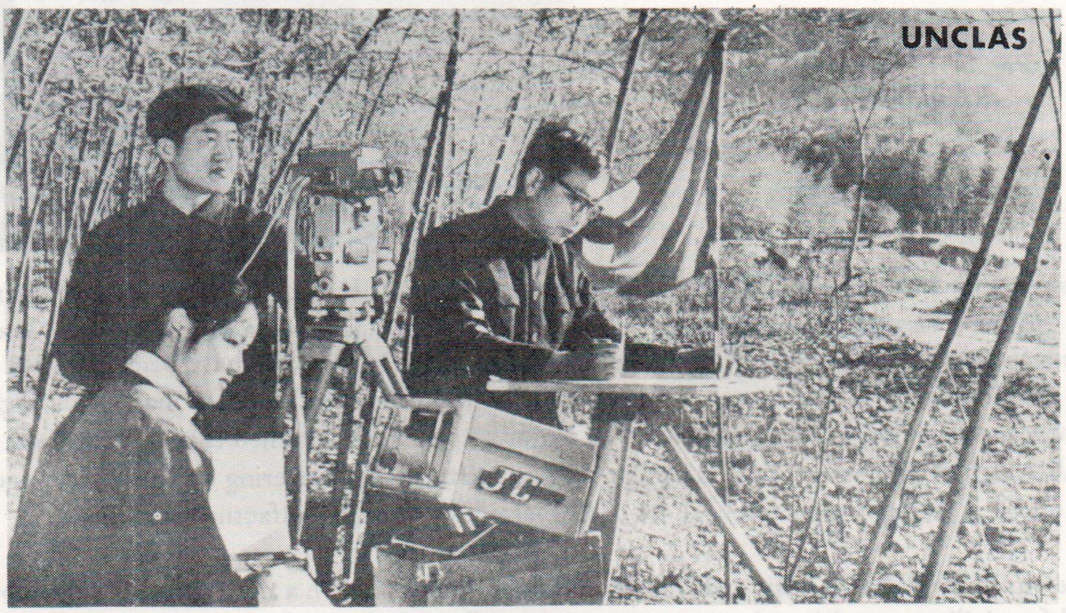

Fig 1. Laser Rangefinder used for Survey Work in China

The first photograph appeared in July 1975 in full colour and is shown in the top picture at fig 1. No details were given, but another photo which appeared later in the year of the same equipment (lower picture) stated that it was made by the Changchow No 2 Electronic Instruments Plant, Kiangsu Province. The laser is mounted on top of a theodolite and a control and read-out box is placed alongside, on top of its container. The power supply is not shown, but there is presumably a battery on the ground nearby. The letters on the theodolite are Chinese, but the control box shows Western lettering. It is possible that a Western laser and controls have been attached to a Chinese theodolite.

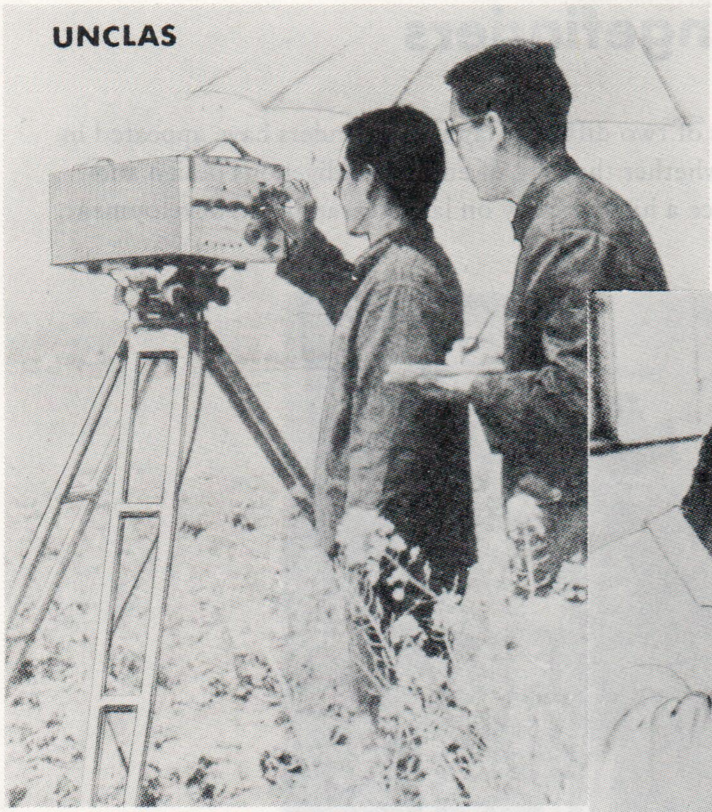

Fig 2. "China's First Laser Rangefinder"

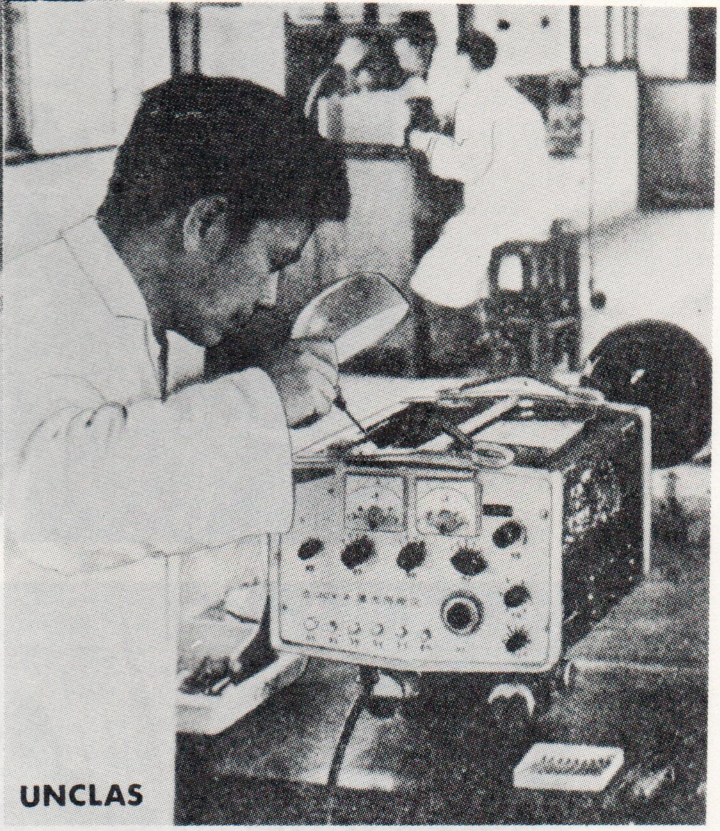

Fig 3. Close-up of Rangefinder

Also in July 1975, two photographs (figs 2 and 3) of another equipment illustrated an article entitled "China's First Laser Rangefinder". The article stated that it was a precision phase laser rangefinder, consisting entirely of Chinese made components. It is said to have been designed and built by the Seismological Instruments Plant of the Wuhan Brigade of the National Seismological Bureau. Apparently meeting design specifications in all major respects, it is claimed that it works well and that it is smaller, lighter and as accurate as similar foreign instruments. Lettering on this laser rangefinder is Chinese and it is thought most likely to be of Chinese design and manufacture as claimed.

The equipment shown in fig 1. is too bulky and delicate to have a military role and is obviously designed for civilian use, although army units might well use it for civilian survey projects. In contrast, the equipment illustrated in figs 2 and 3, is much more compact and rugged and may well be designed for both army and civilian use. It is almost certainly used for survey as it is rather large to be used by forward troops to determine accurate ranges to targets.

These photographs confirm that the Chinese attach some importance to laser equipment. We can expect further developments in the near future.

8. Soviet Centrifugal Oil Filter

The centrifugal oil filter is a device which cleans engine oil by centrifugal action, rather than by passing it through a fine filter in the conventional manner. It is fitted to all Soviet military trucks except the UAZ-469.

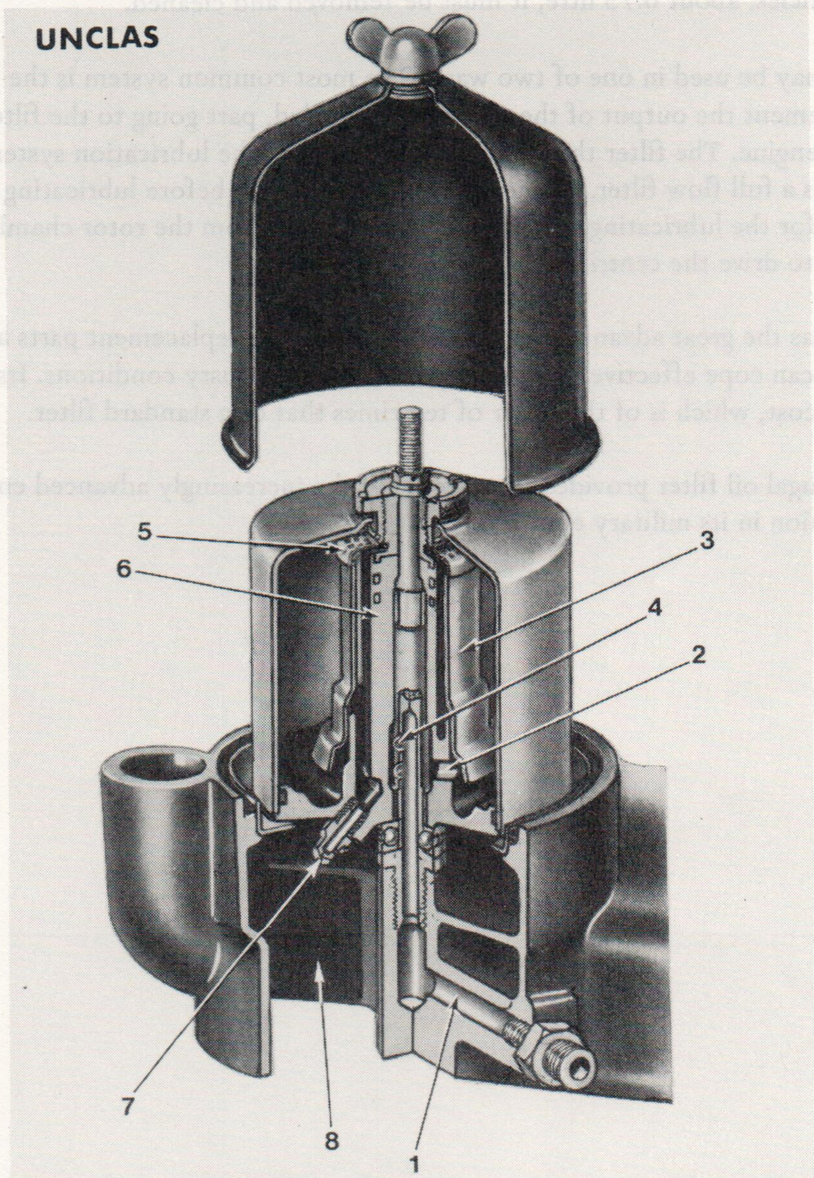

Fig 1. Centrifugal Oil Filter

When the engine is started, oil flows under pump pressure up the inlet bore (1) and into the hollow shaft (2). It then fills up the rotor chamber (3) via the holes (4) in the shaft. When the rotor chamber is full the oil passes through the coarse mesh filter (5) and down the two vertical pipes (6), leading to the nozzles (7). The oil issuing from these nozzles at pump pressure causes the rotor chamber and the oil inside it to spin at high speed.(5000–6000 revs per minute at 294 kPa (42.6 lb/sq in) oil pressure). Particles suspended in the oil are thus deposited on the wall of the rotor chamber by centrifugal force. After passing through the nozzles the oil drains back into the crankcase through the duct (8).

The filter as fitted to the ZIL-130 cleans 8 to 9 litres of oil per minute at 5000 revs per minute compared with 0.16 litres per minute cleaned by a conventional bypass filter. As a consequence particles remain in the oil for only 4.2 minutes on average, compared with 237 minutes for the fine filter, and engine wear is therefore much reduced. When the rotor chamber is 75 per cent full of precipitated particles, about 0.75 litre, it must be removed and cleaned.

The filter may be used in one of two ways. The most common system is the partial flow type. With this arrangement the output of the oil pump is divided, part going to the filter and part being used to lubricate the engine. The filter thus operates in parallel to the lubrication system. The other system uses the device as a full flow filter, all the oil passing through it before lubricating the engine. In this arrangement oil for the lubricating system is tapped directly from the rotor chamber at pump pressure, leaving some oil to drive the centrifuge.

The filter has the great advantage of requiring no routine replacement parts and is easily serviced by the driver. It can cope effectively with dirty oil caused by dusty conditions. Its main drawback is its higher initial cost, which is of the order of ten times that of a standard filter.

The centrifugal oil filter provides an example of the increasingly advanced engineering employed by the Soviet Union in its military equipment.

9. R-107 VHF Manpack Radio

The Soviet R-107 VHF manpack radio set is part of the same series of radios as its vehicle borne counterpart, the R-111, details of which appeared in ATIR 108. As can be seen from the photograph it is quite a large and bulky set by modern Western standards and, because it uses miniature valves its weight is probably between 15 and 20 kg. The set is assembled from prefabricated modules. This makes repair simple, by changing a defective module.

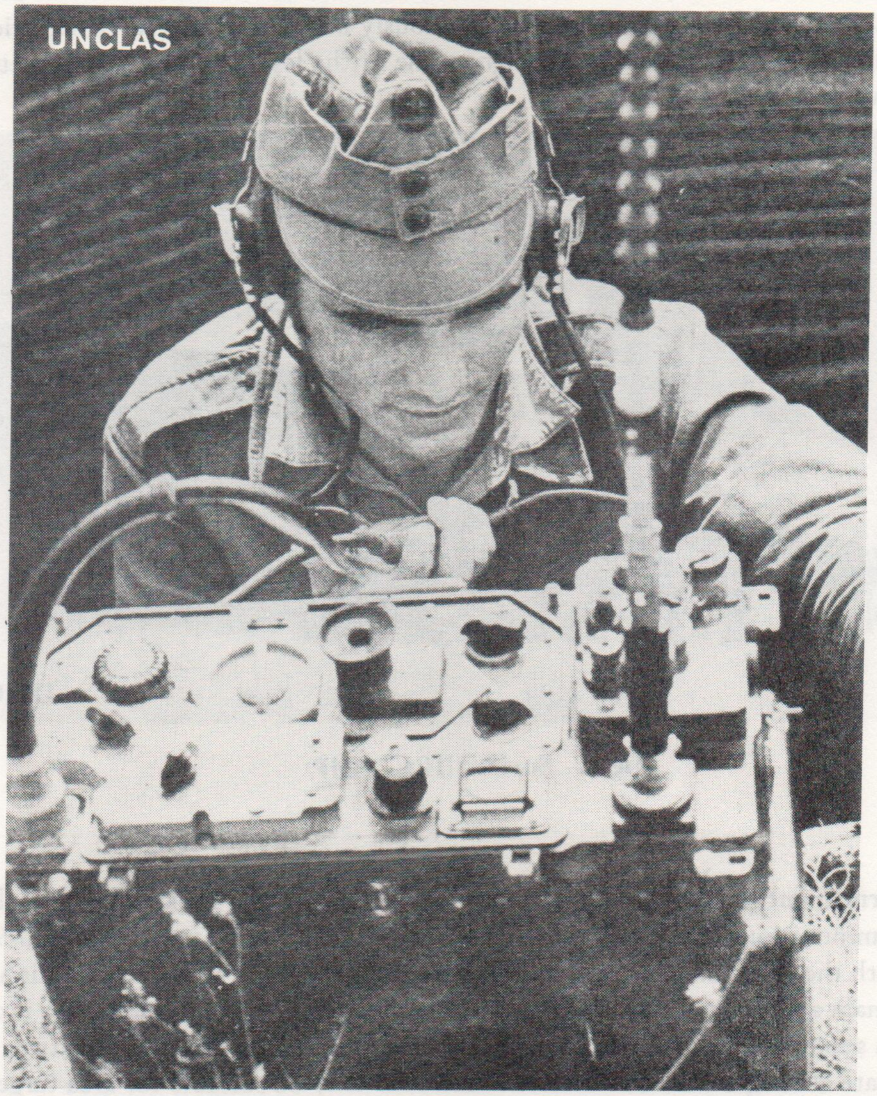

Fig 1. Soviet R-107 VHF Manpack Radio

Technical Parameters

a.	Frequency Range:	20 to 52 MHz
b.	Frequency Bands:	2: 20–36 MHz and 36–52 MHz
c.	Preset Frequencies:	4
d.	Power Supply:	5 volts from two 2 KNP 20 nickel-cadmium batteries
e.	Receiver Type:	Double Conversion Super Heterodyne

10. BMP – User Aspects and Weaknesses

Introduction

BMP, introduced into the Soviet Army in 1967, was the first true MICV to appear in service with any Army. It is now to be seen in large numbers in the Soviet Forces as well as in other Warsaw Pact armies such as the East German and Czech. The main features and characteristics of BMP are now becoming well known and have been described previously in this journal (ATIR Restricted No 96). It is therefore intended in this article to highlight some of the lesser known user aspects of the vehicle and some of its weaknesses.

Fig 1. Soviet MICV–BMP

Fire Power

The main armament of BMP is a 73 mm smooth bore gun firing fin stabilised, rocket assisted HEAT and HE ammunition. The HEAT projectile is the same as that used in the RPG-9 recoilless anti-tank gun, but with the addition of a small brass obturating cartridge to give it the initial boost out of the barrel. The main armament is not stabilised but it is nevertheless possible to fire it on the move at slow speeds with some effect, since the power traverse and elevation are very sensitive. The gun itself becomes inaccurate at ranges over 800 metres and would only be suitable for area targets above this range. The HEAT round will penetrate up to 330 mm of armour but as the jet is rather small it will only kill a tank if it hits it in a vulnerable place. A HEAT jet is degraded by passing through alternate metal and air gaps, so any form of spaced armour on the target, such as side plates or even turret bins, will lessen the chance of BMP scoring a kill.

Fig 2. is a view looking directly down into the turret of BMP. The automatic loader and moving chain of stowage containers for the 73 mm rounds can be seen in the centre. The automatic loader is activated by the gunner pressing a button. It is very positive and quick acting, taking about two seconds for its cycle. However the gun has to adopt a horizontal position for loading and this causes some delay. A rate of fire in excess of ten rounds per minute can be achieved.

A pipe on the inside of the empties bin is connected to the main fume extraction system and is an example of the trouble the Soviets have taken to get rid of the fumes from firing which would otherwise asphyxiate the crew when closed down.

Fig 3. shows details of a firing port. As can be seen this is a sophisticated ball and socket arrangement designed to accept the standard AKM assault rifle. The front port on either side takes the PKM general purpose machine gun. The top half of the port is an armoured aiming glass, equipped with an electric de-mister, and the bottom half contains a removable clamp to fit the rifle. The knob at the left of the port is for closing and locking the outside armoured cover. The flexible hose clamps onto the rifle and extracts the fumes after firing.

Four SAGGER ATGW are carried in BMP and the missile can be reloaded on to its launch rail on the 73 mm gun through a hatch immediately behind the gun. The SAGGER control joystick is stowed under the gunner's seat and is hinged up between his knees when required. SAGGER has an effective range of 3,000 metres but the system has many shortcomings which can sometimes be exploited. Its minimum range is 500 metres and it is difficult to control up to about 1,000 metres. It has to be launched at a fairly high angle and is therefore easy to detect; in addition its slow flight speed means it takes some twenty-six seconds to reach its maximum range giving time for the target to fire at the launcher or take avoiding action if the missile is spotted. The missile reacts slowly to changes in course and hence swerving or moving by the target at the last minute can cause a miss. Finally the missile's overall effectiveness is very much reduced at night.

BMP has no built in anti-aircraft capability although the SA-7 shoulder-launched, tail chasing SAM is carried by some BMPs. This weapon is intended for dismounted air defence and, although possible, it would be dangerous to fire it from the vehicle. The PKT co-axial MG could be used against slow moving helicopters but its effectiveness in this role is questionable. GRAIL

Mobility

BMP is powered by a 290 hp V-6 diesel engine. This gives it a power to weight ratio of 23 bhp/ton and produces good acceleration and a high road speed. Off the road however its performance is limited by its slow manual gear change and clutch, in spite of the fact that these are servo-assisted, as well as by the fairly hard suspension. BMP would be no match for the CVR-T series of vehicles or even an FV 432 across country.

Steering is by a handlebar arrangement (fig 4.). It is power assisted and very sensitive; fast turns can be executed even at fairly high speeds although care must be taken not to throw a track. A gyro course indicator is a standard fitting in the driver's compartment as it is in all modern Soviet AFVs.

BMP requires very little preparation for swimming but when in the water its performance is poor. It is propelled by its tracks at a best speed of 7–8 kph, it does not turn easily and strong currents will hinder it. It will also have considerable difficulty in getting out up steep banks and in reversing in the water to try other exits.

Protection

In order to give BMP its mobility and in particular its amphibious capability, the Soviets have had to compromise severely on armour protection. The armour, although of good quality steel, is only comparable in thickness to an FV 432. The sharply pointed nose of BMP provides better frontal protection however and heavy machine gun fire or even cannon fire would not penetrate here as it might easily do elsewhere on the vehicle. Fuel tanks are incorporated in the rear doors. As with Soviet tanks, few precautions have been taken to prevent fire after penetration.

The Soviet MICV is fully sealed and a filter system gives complete collective protection for operations in nuclear fallout and chemical environments. There is no anti-nuclear radiation protective lining fitted.

Conclusions

Although it has been in service for over eight years, BMP is still a modern and effective fighting vehicle. Novel features such as the automatic loader provided many suprises for the West when they learnt about them. But like all AFVs it does have its weak points: in spite of being heavily armed for a vehicle of its size and type, all the weapons have their limitations. The mobility is not as good as it might be off the road or in water and the armour protection is lighter than we ourselves would want in an MICV.

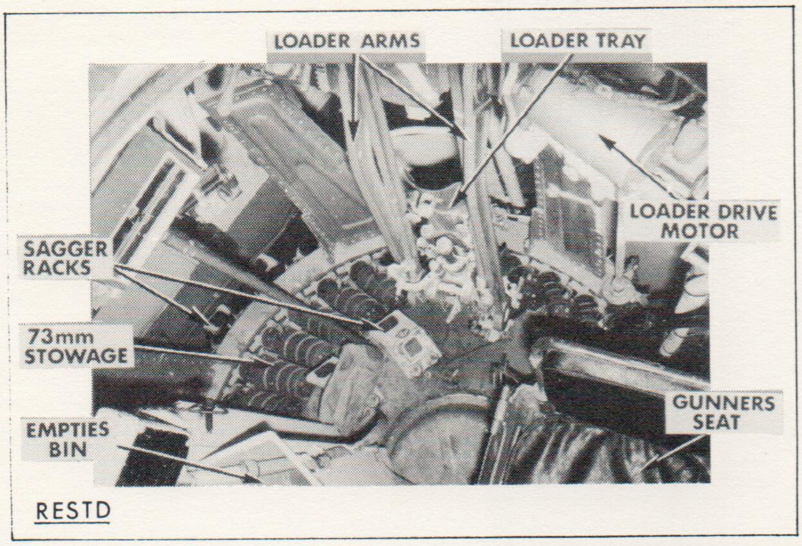

Fig 2. BMP-A Turret Interior Showing Automatic Loader

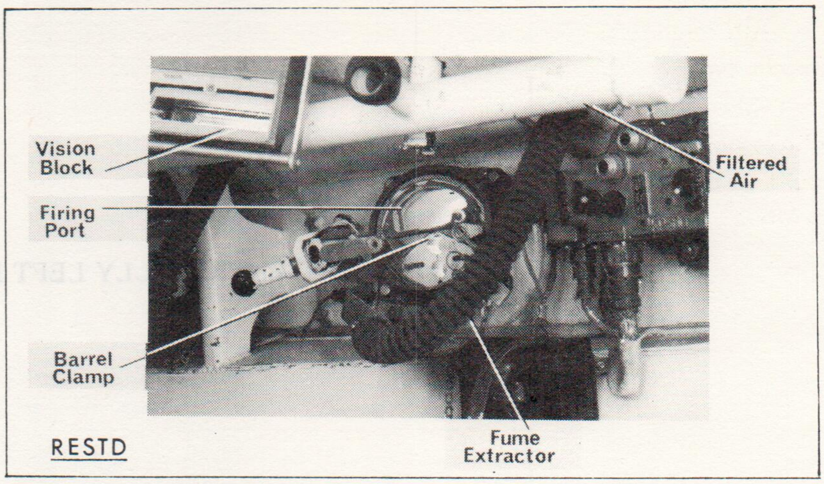

Fig 3. BMP-A Interior Showing Firing Port

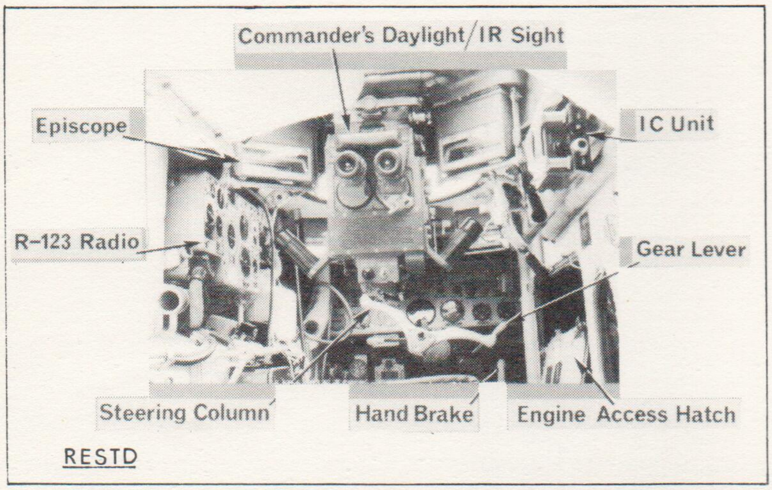

Fig 4. BMP-A Looking Forward from Commanders Position

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